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09/988,758	11/20/2001	Hideyuki Kitagawa	SON-2262	9111

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RADER FISHMAN & GRAUER PLLC
LION BUILDING
1233 20TH STREET N.W., SUITE 501
WASHINGTON, DC 20036

EXAMINER	
TRAN, TRANG U	

ART UNIT	PAPER NUMBER
2614	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/988,758	Applicant(s) KITAGAWA, HIDEYUKI	
	Examiner Trang U. Tran	Art Unit 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The substitute specification filed Feb. 27, 2004 has been entered.

Drawings

2. The drawings are objected to because the number of bits input to LUT memory 13 should be changed from 10 to 11. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hwung et al. (US Patent No. 5,473,373).

In considering claim 1, Hwung et al discloses all the claimed subject matter, note 1) the claimed a digital-signal-processing circuit having a gamma-correction unit for carrying out gamma correction on an input digital video signal by using a gamma-correction table, wherein the number of bits input to said gamma-correction unit is set at a value greater than the number of bits output from said gamma-correction unit is met by the ROM look-up table 70 which performs the gamma correction equations of the 10-

bit input signal (X) is received from DSP 30 (Fig. 1) and converts to 8-bit output signal which provided to the multiplexer (MUX) 90 (Fig. 8, col. 5, line 50 to col. 6, line 41).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2-4, 6-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwung et al. (US Patent No. 5,473,373) in view of Naito (US Patent No. 6,462,735 B2).

In considering claim 2, Hwung et al discloses all the claimed subject matter, note 1) the claimed wherein: a signal-processing unit is provided at a stage preceding said gamma-correction unit and used to apply an arbitrary gain to said input digital video signal is met by the digital signal processor (DSP) 30 which is typically used to enhance signal X', including color correction, image enhancement, contrast control, white balance, luminance processing, and chrominance processing and then output to the gamma correction circuit for gamma corrected (Fig. 1, col. 1, lines 14-27 and col. 2, lines 35-50). However, Hwung et al explicitly do not disclose the claimed the number of bits output from said gamma-correction unit is set at a value greater than the number of bits input to said signal-processing unit.

Naito teaches that a description will be given of gamma correction performed by a digital gamma correction circuit 220 shown in Fig. 1, the digital gamma correction

circuit 220 performs gamma correction on an n-bit digital signal output from the A/D converter 100, for example, an 8-bit digital signal (256-level gray scale) based on memory information predetermined by applied voltage-transmittance characteristics within a transmittance range of 0% to 100% so as to convert it into N-bits ($N \geq n+2$), for example, a 10-bit digital signal (Fig. 1, col. 8, line 61 to col. 9, line 35).

Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the digital gamma correction as taught by Naito into Hwung et al's system in order to allows the range for using applied voltage-transmittance characteristics inherent in the electro-optical device to be enlarged, this can lead to provision of an image with satisfactory brightness and high contrast (col. 4, lines 11-16 of Naito).

In considering claim 3, Hwung et al discloses all the claimed subject matter, note 1) the claimed a display apparatus comprising: display means employing electro-optical devices, each having a non-linear response characteristic is met by the non-linear characteristics of the cathode ray tube (CRT) display monitor 50 (Fig. 1, col. 1, lines 14-27), and 2) the claimed a digital-signal-processing circuit having a gamma correction unit for carrying out gamma correction on an input digital video signal by using a gamma-correction table, wherein the number of bits input to said gamma-correction unit is set at a value greater than the number of bits output from said gamma correction unit is met by the ROM look-up table 70 which performs the gamma correction equations of the 10-bit input signal (X) is received from DSP 30 (Fig. 1) and converts to 8-bit output signal which provided to the multiplexer (MUX) 90 (Fig. 8, col. 5, line 50 to col. 6, line

41). However, Hwung et al explicitly do not disclose the claimed D/A-conversion means for converting a digital video signal obtained as a result of signal processing carried out by said digital-signal-processing circuit into an analog video signal and outputting said analog video signal to said display means.

Naito teach that the signal processing circuit 200 has ASIC 210 and a digital-to-analog (D/A) conversion block 260, the ASIC 210 includes the digital gamma correction circuit 220 for performing gamma correction on a digital picture signal which is output from the A/D converter 100, the D/A conversion block 260 for converting the digital picture signals to analog picture signals (Fig. 1, col. 7, line 15 to col. 8, line 60).

Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the D/A converter as taught by Naito into Hwung et al' s system in order to outputs the analog picture signal and amplifying the outputs picture signal to reverse the polarity of voltage applied to the electro-optical material in a specified cycle (col. 4, lines 30-39 of Naito).

In considering claim 4, the claimed wherein said electro-optical devices are each a liquid-crystal cell is met by the liquid crystal device 400 (Fig. 2, col. 7, line 63 to col. 8, line 60 of Naito).

In considering claim 6, the claimed wherein said electro-optical devices are a cathode ray tube is met by the non-linear characteristics of the cathode ray tube (CRT) display monitor 50 (Fig. 1, col. 1, lines 14-27 of Hwung et al).

In considering claim 7, Hwung et al discloses all the claimed subject matter, note 1) the claimed wherein: said digital-signal-processing circuit has a signal-processing

unit provided at a stage preceding said gamma-correction unit and used to apply an arbitrary gain to said input digital video signal is met by the digital signal processor (DSP) 30 which is typically used to enhance signal X', including color correction, image enhancement, contrast control, white balance, luminance processing, and chrominance processing and then output to the gamma correction circuit for gamma corrected (Fig. 1, col. 1, lines 14-27 and col. 2, lines 35-50). However, Hwung et al explicitly do not disclose the claimed the number of bits output from said gamma-correction unit is set at a value greater than the number of bits input to said signal-processing unit.

Naito teaches that a description will be given of gamma correction performed by a digital gamma correction circuit 220 shown in Fig. 1, the digital gamma correction circuit 220 performs gamma correction on an n-bit digital signal output from the A/D converter 100, for example, an 8-bit digital signal (256-level gray scale) based on memory information predetermined by applied voltage-transmittance characteristics within a transmittance range of 0% to 100% so as to convert it into N-bits ($N \geq n+2$), for example, a 10-bit digital signal (Fig. 1, col. 8, line 61 to col. 9, line 35).

Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the digital gamma correction as taught by Naito into Hwung et al's system in order to allows the range for using applied voltage-transmittance characteristics inherent in the electro-optical device to be enlarged, this can lead to provision of an image with satisfactory brightness and high contrast (col. 4, lines 11-16 of Naito).

Claim 8 is rejected for the same reason as discussed in claim 4.

Claim 10 is rejected for the same reason as discussed in claim 6.

In considering claim 11, Hwung et al discloses all the claimed subject matter, note 1) the claimed a digital-signal-processing circuit having a gamma correction unit for carrying out gamma correction on an input digital video signal by using a gamma-correction table, wherein the number of bits input to said gamma-correction unit is set at a value greater than the number of bits output from said gamma correction unit is met by the ROM look-up table 70 which performs the gamma correction equations of the 10-bit input signal (X) is received from DSP 30 (Fig. 1) and converts to 8-bit output signal which provided to the multiplexer (MUX) 90 (Fig. 8, col. 5, line 50 to col. 6, line 41). However, Hwung et al explicitly do not disclose: 1) the claimed a liquid-crystal projector comprising: an CD panel comprising a matrix of pixels each implemented by a liquid-crystal cell and radiation means for radiating beams to the area of said LCD panel, and 2) the claimed D/A-conversion means for converting a digital video signal obtained as a result of signal processing carried out by said digital-signal-processing circuit into an analog video signal and outputting said analog video signal to said display means.

1) Naito teaches that in the projection display device 1100 show in Fig. 10, projection light from a lamp unit 1102 of a white light source is divided into three basic colors of R, G, and B by a plurality of mirrors 1106 and two dichroic mirrors 1108 inside a light guide 1104 so as to be led into three liquid crystal devices 1110R, 1110G, and 1110B for displaying an image made from each color, each of the liquid crystal devices has a circuit block as shown in Figs. 1 and 2 (Fig. 10, col. 16, lines 4-31). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to

incorporate the liquid-crystal projector as taught by Naito into Hwung et al's system in order to provide a display device having an electro-optical device such as a liquid crystal device, or the like, in which transmittance (reflectance) varies with applied voltage (col. 1, lines 6-10 of Naito).

2) Naito also teaches that the signal processing circuit 200 has ASIC 210 and a digital-to-analog (D/A) conversion block 260, the ASIC 210 includes the digital gamma correction circuit 220 for performing gamma correction on a digital picture signal which is output from the A/D converter 100, the D/A conversion block 260 for converting the digital picture signals to analog picture signals (Fig. 1, col. 7, line 15 to col. 8, line 60).

Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the D/A converter as taught by Naito into Hwung et al' s system in order to outputs the analog picture signal and amplifying the outputs picture signal to reverse the polarity of voltage applied to the electro-optical material in a specified cycle (col. 4, lines 30-39 of Naito).

Claim 12 is rejected for the same reason as discussed in claim 7 above.

7. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwung et al. (US Patent No. 5,473,373) in view of Naito (US Patent No. 6,462,735 B2), as applied in claims 3 and 7 above, and further in view of Urabe et al. (US Patent No. 6,614,174 B1).

In considering claim 5, the combination of Hwung et al and Naito disclose all the limitations of the instant invention as discussed in claim 3 above, except for providing the claimed wherein said electro-optical devices are each an organic electro-

luminescent device. Urabe et al teach that an organic electro-luminescent element may be utilized as a pixel of, for example, an active matrix type display apparatus, an organic electro-luminescent display apparatus using an organic electro-luminescent element as its pixel is regarded as a promising next generation flat panel display apparatus in place of a liquid crystal display apparatus (Fig. 7, col. 1, line 17 to col. 2, line 15). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the electro-optical devices are each an organic electro-luminescent device as taught by Urabe et al into the combination of Hwung et al and Naito's system in order to provide the display device which generally possesses advantages such as space-saving, light weight and low electric power consumption.

Claim 9 is rejected for the same reason as discussed in claim 5.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Van Mourik (US Patent No. 6,215,468 B1) discloses circuit for converting an 8-bit input video signal into a 10-bit gamma corrected output video signal.

Kim (US Patent No. 5,585,846) discloses image signal processing circuit in a digital camera having gain and gamma control.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trang U. Tran whose telephone number is (703) 305-0090. The examiner can normally be reached on 8:00 AM - 5:30 PM, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TT
May 7, 2004

TRANG TRAN
PATENT EXAMINER